occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

WHAT WE CLAIMED:

1. A hybrid microturbine engine having a pair of rotor spools and said rotor spools each have a compressor, said compressors are staged, one of said pair of spools being a turbocharger, the other of the said spool comprising a turbine, compressor and alternator wherein said turbine including blades for being driven by gaseous fluid developed by said microturbine engine and said compressor having blades for compressor air delivered to said microturbine engine, said other of said stages for driving said alternator for developing electricity wherein said the recuperator of said microturbine engine is eliminated.

2. An electrical power generating device as claimed in claim1, wherein said hybrid microturbine engine said rotor spools are module assemblies consisting of a said rotor spool, rotor spool bearings and said bearings are retained within a bearing housing and axially insertable into said hybrid microturbine.

3. An electrical power generating device as claimed in claim 2, wherein said hybrid microturbine engine with said rotor spool module assemblies, axially insertable into the hybrid microturbine engine housing, have a an

oil squeeze film damper cavity between the inner diameter of the said engine housing and outer diameter of the said bearing housings.

4. A hybrid microturbine engine having a pair of rotor spools and said rotor spools each have a compressor, said compressors are staged, one of said pair of spools being a turbocharger, the other of the said spools comprising a turbine, compressor and alternator wherein said turbine including blades for being driven by gaseous fluid developed by said microturbine engine and said compressor having blades for compressor air delivered to said microturbine engine, said other of said stages for driving said alternator for developing electricity wherein said the recuperator of said microturbine engine is eliminated. Said rotor spools have rotor bearings mounted within a bearing housing within the said engine with shaft seals mounted in said bearing housing and between the said rotor spool bearing and said compressor air inlet and the said shaft seals incorporate o-rings between said shaft seal outside diameter and bearing housing to both seal and circumferentially retain the said shaft seal.

5. A hybrid microturbine engine having a pair of rotor spools and said rotor spools each have a compressor, said compressors are staged, one of said pair of spools being a turbocharger, the other of the said spools comprising a turbine, compressor and alternator wherein said turbine including blades for being driven by gaseous fluid developed by said microturbine engine and said compressor having blades for compressor air

delivered to said microturbine engine, said other of said stages for driving said alternator for developing electricity wherein said the recuperator of said microturbine engine is eliminated. Said rotor spools have rotor bearings mounted within said bearing housing and within the said engine have a controlled radial gap between the said bearing outside diameter and said bearing housing inside diameter for oil squeeze film damping.

6. An electrical power generating device as claimed in claim 5, wherein said bearing housing outside diameter and is received into said engine inside diameter area and have common resilient o-ring details and are both an anti rotation device and seal for said oil squeeze film damper area.

7. An electrical power generating device as claimed in claim 5, wherein the said rotor bearing within said bearing housing with said squeeze film damper is axially and circumferentially restrained by the said bearing housing having a snap ring with ends open and with common radially displaced lugs where one lug is integral to the said bearing and the other integral to the said static bearing housing. The engine operation with rotor spool rotation causes a circumferential bearing lug force to the snap ring end and said end co-acting with the static said bearing housing lug resists the said bearing force from circumferential movement.

8. A hybrid microturbine engine having a pair of rotor spools and said rotor spools each have a compressor, said compressors are staged, one of said pair of spools being a turbocharger, the other of the said spools

comprising a turbine, compressor and alternator wherein said turbine including blades for being driven by gaseous fluid developed by said microturbine engine and said compressor having blades for compressor air delivered to said microturbine engine, said other of said stages for driving said alternator for developing electricity wherein said the recuperator of said microturbine engine is eliminated. The said turbocharger spool having a rotor shaft with a thrust bearing retained to the said shaft are retained to the bearing housing from one end and all retained to the turbocharger spool housing. The said bearing housing and said thrust bearing have a common fastener to the said rotor spool housing and is located between the said thrust bearing outer race and the snap ring within the bearing housing and has axial and radial clearances to allow the said bearing housing and said bearing to have radial freedom for squeeze oil film damper rotor dynamic stability. The said fastener is restrained to the said rotor bearing housing, bearings and turbocharger rotor spool and becomes the turbocharger rotor module wherein this said module attaches to the said turbocharger rotor spool housing.

9. An electrical generation system wherein as claimed in claim 8 the said rotor spool module is axially insertable into the said turbocharger rotor spool housing.

10. A hybrid microturbine engine having a pair of rotor spools and said rotor spools each have a compressor, said compressors are staged, one of

said pair of spools being a turbocharger, the other of the said spools comprising a turbine, compressor and alternator wherein said turbine including blades for being driven by gaseous fluid developed by said microturbine engine and said compressor having blades for compressor air delivered to said microturbine engine, said other of said stages for driving said alternator for developing electricity wherein said the recuperator of said microturbine engine is eliminated. Within the said microturbine having an electrical stator with iron material laminated and electrical wire, and relative rotation between the said spool with said alternator rotor and having permanent magnets therein, electrical power output from said stator electrical wire are thru said wire wherein and attached to output electrical power lugs and said lugs are attached to a common output lug insulation block which is attached to the microturbine housing.

11. A hybrid microturbine engine having a pair of rotor spools and said rotor spools each have a compressor, said compressors are staged, one of said pair of spools being a turbocharger, the other of the said spools comprising a turbine, compressor and alternator rotor wherein said turbine including blades for being driven by gaseous fluid developed by said microturbine engine and said compressor having blades for compressor air delivered to said microturbine engine, said other of said stages for driving said alternator for developing electricity wherein said the recuperator of said microturbine engine is eliminated. The said spool

having a said compressor, said turbine and said alternator are housed within the said microturbine housing and this microturbine housing incorporates predominant tangent air nozzles located in the compressor housing exiting end area of the said housing wherein the compressor exiting blades area communicate with directed said nozzles as a means to cause rotation of the said spool of the said microturbine for starting operation.

12. A hybrid microturbine engine having a pair of rotor spools and said rotor spools each have a compressor, said compressors are staged, one of said pair of spools being a turbocharger, the other of the said spools comprising a turbine, compressor and alternator wherein said turbine including blades for being driven by gaseous fluid developed by said microturbine engine and said compressor having blades for compressor air delivered to said microturbine engine, said other of said stages for driving said alternator for developing electricity wherein said the recuperator of said microturbine engine is eliminated. A combustor housing of the said microturbine fluid communicates with the said microturbine said compressor and also the microturbine turbine nozzle with fluid communication the said microturbine turbine, the said turbine nozzle has a seal wherein said seal contacts the inner diameter of the said combustor housing as a land area and the said land area adjacent to the seal has a plurality of housing stand-off opposite side of the said land as a means of

drawing heat away from the said land area using transitional air flow to the combustor and wherein also supports the combustor inside diameter

13. A hybrid microturbine engine having a pair of rotor spools and said rotor spools each have a compressor, said compressors are staged, one of said pair of spools being a turbocharger, the other of the said spools comprising a turbine, compressor and alternator wherein said turbine including blades for being driven by gaseous fluid developed by said microturbine engine and said compressor having blades for compressor air delivered to said microturbine engine, said other of said stages for driving said alternator for developing electricity wherein said the recuperator of said microturbine engine is eliminated. A combustor housing of the said microturbine with fluid communication to the said compressor and said turbine has fluid communication with the said turbocharger spool turbine thru a scroll section of the said combustor housing and this said scroll communicates with both said spool turbines and has centerline flow exiting the microturbine said turbine and directs the same centerline flow to the said turbocharger turbine within a turbocharger turbine nozzle is in the same said centerline flow.

14. A hybrid microturbine engine having a pair of rotor spools and said rotor spools each have a compressor, said compressors are staged, one of said pair of spools being a turbocharger, the other of the said spools comprising a turbine, compressor and alternator wherein said turbine

including blades for being driven by gaseous fluid developed by said microturbine engine and said compressor having blades for compressor air delivered to said microturbine engine, said other of said stages for driving said alternator for developing electricity wherein said the recuperator of said microturbine engine is eliminated. An air inlet duct within the said microturbine with fluid communication between the said turbocharger compressor and said microturbine compressor such to induce a fluid preswirl in direction of rotation to the microturbine compressor inlet flow.

15. A hybrid microturbine engine having a pair of rotor spools and said rotor spools each have a compressor, said compressors are staged, one of said pair of spools being a turbocharger, the other of the said spools comprising a turbine, compressor and alternator wherein said turbine including blades for being driven by gaseous fluid developed by said microturbine engine and said compressor having blades for compressor air delivered to said microturbine engine, said other of said stages for driving said alternator for developing electricity wherein said the recuperator of said microturbine engine is eliminated. An electrical stator module is located within the microturbine housing, and the said electrical stator has a laminated iron base core stator with electrical wire and located about and co-axial to the said alternator rotor of said microturbine with a cooling sleeve integrated to the said stator outer diameter which is received inside the microturbine housing and this product area between the outside of the

fluid is passed to remove the heat from the said stator.

16. A hybrid microturbine engine having a pair of rotor spools and said rotor spools each have a compressor, said compressors are staged, one of said pair of spools being a turbocharger, the other of the said spools comprising a turbine, compressor and alternator wherein said turbine including blades for being driven by gaseous fluid developed by said microturbine engine and said compressor having blades for compressor air delivered to said microturbine engine, said other of said stages for driving said alternator for developing electricity wherein said the recuperator of said microturbine engine is eliminated. A housing insulating air gap within the said microturbine engine and co-axial to the said microturbine spool and is positioned axially between the said microturbine spool compressor rotor having an integral shaft to the compressor inlet and the proximal shaft seal end . Said shaft seal will have inherent fluid leakage from the said compressor inlet and this leakage flow will be transitioned radially thru the said structure air insulation gap which is adjacent to the said compressor inlet spool area and thus minimize said microturbine compressor inlet radiant heat to the microturbine bearing housing area.